WHAT IS CLAIMED IS:

1. A method for detecting inactivation of a *CASP8* gene, comprising detecting a modification of genomic DNA comprising the *CASP8* gene, wherein such a modification results in inactivation of a *CASP8* gene.

2. The method according to claim 1, wherein the modification of genomic DNA resulting in inactivation of a *CASP8* gene is detected by detecting the absence of a CASP8 protein in a sample from a cell.

3. The method according to claim 2, wherein the absence of a CASP8 protein is detected by a method selected from the group consisting of immunoassay and biochemical assay.

4. The method according to claim 1, wherein the modification of genomic DNA resulting in inactivation of a *CASP8* gene is methylation of *CASP8* promoter.

5. The method according to claim 4, wherein methylation of the *CASP8* promoter is detected by methylation polymerase chain reaction (PCR) assay.

6. The method according to claim 1, wherein the modification of genomic DNA resulting in inactivation of a *CASP8* gene is a mutation in the *CASP8* genomic gene.

1   7.   The method according to claim 6, wherein the mutation is selected from the

2   group consisting of an insertion in the gene, a deletion of the gene, a truncation of the gene, a

3   nonsense mutation, a frameshift mutation, a splice-site mutation, and a missense mutation.

1   8.   The method according to claim 6, wherein the mutation is a deletion in the

2   *CASP8* gene.

1   9.   The method according to claim 8, wherein deletion of the *CASP8* gene is

2   detected with a labeled nucleic acid probe.

10.   A method for diagnosis or prognosis of a cancer comprising detecting

inactivation of a *CASP8* gene, wherein inactivation of the *CASP8* gene is indicative of the

presence of a cancer or a poor prognosis.

11.   The method according to claim 10, wherein the cancer is a tumor in which

a *myc* gene is amplified.

1   12.   The method according to claim 10, wherein the cancer is a neuroblastoma.

1   13.   The method according to claim 10, wherein the modification of genomic

2   DNA resulting in inactivation of a *CASP8* gene is detected by detecting the absence of a CASP8

3   protein in a sample from a cell.

1   14.   The method according to claim 13, wherein the absence of a CASP8

2   protein is detected by a method selected from the group consisting of immunoassay and

3   biochemical assay.

15.   The method according to claim 10, wherein the modification of genomic

DNA resulting in inactivation of a *CASP8* gene is methylation of *CASP8* promoter.

16.   The method according to claim 15, wherein methylation of the *CASP8*

promoter is detected by methylation polymerase chain reaction (PCR) assay.

17.   The method according to claim 10, wherein the modification of genomic

DNA resulting in inactivation of a *CASP8* gene is a mutation in the *CASP8* genomic gene.

1   18.   The method according to claim 17, wherein the mutation is selected from

2   the group consisting of an insertion in the gene, a deletion of the gene, a truncation of the gene, a

3   nonsense mutation, a frameshift mutation, a splice-site mutation, and a missense mutation.

1   19.   The method according to claim 17, wherein the mutation is a deletion in the

2   *CASP8* gene.

20. The method according to claim 19, wherein deletion of the *CASP8* gene is detected with a labeled nucleic acid probe.

21. A nucleic acid comprising at least a part of the genomic gene encoding CASP8, wherein the nucleic acid is selected from the group consisting of:

a) a *CASP8* genomic DNA;

b) a *CASP8* promoter;

c) a nucleic acid amplified by primers that correspond to a sequence selected from the group consisting of SEQ ID NOS: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, and 28;

d) a *CASP8* exon;

e) a *CASP8* intron;

f) a nucleic acid having at least 15 bases and hybridizable under stringent conditions to a *CASP8* non-coding sequence.

22. The nucleic acid according to claim 21 which is a *CASP8* genomic DNA having a nucleic acid sequence as depicted in SEQ ID NO: 3, 4, 5, 6, 7, 8, 9, or 10.

23. The nucleic acid according to claim 21 which is a *CASP8* promoter having a nucleic acid sequence as depicted in SEQ ID NO: 1 or 2.

1   24.   The nucleic acid according to claim 21 which is an oligonucleotide that

2   hybridizes to the *CASP8* promoter, wherein the oligonucleotide is a PCR primer for the promoter.

1   25.   The nucleic acid according to claim 21 which is an oligonucleotide having

2   at least 15 bases and hybridizable under stringent conditions to a *CASP8* non-coding sequence,

3   which oligonucleotide is labeled.

1   26.   A kit for detecting inactivation of a *CASP8* gene comprising a detection

2   assay for inactivation of a *CASP8* gene.

1   27.   The kit of claim 26, wherein the detection assay is an immunoassay.

1   28.   The kit of claim 26, wherein the detection assay comprises oligonucleotide

2   PCR primers for amplification of at least a part of *CASP8* genomic DNA.

1   29.   The kit of claim 26, wherein the detection assay comprises a labeled

2   oligonucleotide of at least 15 bases that specifically hybridizes to *CASP8* genomic DNA.

1   30.   A method of treating a cancer in a subject comprising administering an

2   amount of a vector that expresses a gene encoding functional CASP8 effective to express a

3   functional level of CASP8 into cells of the subject

1   31.   The method according to claim 30, wherein the cancer is a tumor in which

2 a *myc* gene is amplified.

1   32.   The method according to claim 30, wherein the cancer is a neuroblastoma.

1   33.   The method according to claim 30, wherein a *CASP8* gene is inactivated in

2 tumor cells of the cancer.

1   34.   The method according to claim 30, wherein the vector comprises a

promoter that provides for high level expression operatively associated with the gene encoding a

functional CASP8, whereby the functional CASP8 is expressed at high levels.

1   35.   The method according to claim 30, wherein the vector is selected from the

group consisting of a defective herpes virus (HSV) vector, a defective adenovirus vector, and a

non-viral vector.

1   36.   A vector that expresses a gene encoding functional human CASP8 in

2 human target cells.

1   37.   The vector of claim 36 comprising a promoter that provides for high level

2 expression operatively associated with the gene encoding a functional CASP8, whereby the

3 functional CASP8 is expressed at high levels.

38.   A pharmaceutical composition for treating a cancer comprising the vector of claim 32 and a pharmaceutically acceptable carrier.

1   39.   A method of screening for a candidate compound that induces death-
2   receptor-mediated apoptosis in cells where a CASP8 gene is inactivated, comprising contacting
3   cells in which a CASP8 gene is inactivated with a candidate compound and detecting whether the
4   cell undergoes apoptosis.

40.   The method according to claim 39, wherein the cell comprises a genetically modified death receptor of the Fas/TNFR receptor family operably associated with a reporter gene, whereby activation of the death receptor results in expression of the reporter gene.

41.   The method according to claim 40, wherein the death receptor is DR3.

1   42.   The method according to claim 40, wherein the reporter gene is a green
2   fluorescent protein (GFP).

1   43.   The method according to claim 39, wherein inactivation of the CASP8 gene
2   results from methylation of CASP8 promoter.

1   44.   The method according to claim 39, wherein inactivation of the CASP8 gene

1   results from a mutation in the *CASP8* genomic gene.

1   45.   A kit for screening for a candidate compound that induces death-receptor-

2   mediated apoptosis in cells where a *CASP8* gene is inactivated, comprising cells in which a

3   *CASP8* gene is inactivated and a detection assay for whether the cell undergoes apoptosis.

1   46.   The kit of claim 45, wherein inactivation of the *CASP8* gene results from

2   methylation of *CASP8* promoter.

1   47.   The kit of claim 45, wherein inactivation of the *CASP8* gene results from a

2   mutation in the *CASP8* genomic gene.